Conclusion: Performing risk stratification in the ED for the high-risk and low-risk patient with decompensated heart failure using valid predictors for inpatient complications to avoid routine use of cardiac monitoring for all heart failure admissions is a possible cost-effective intervention. A larger patient population or multicenter study is needed to test this defined low-risk patient population for safe admission to an unmonitored unit.

16 Recidivism in Hypertensive Patients in the Emergency Department

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Study objectives: Fifty million Americans are known to be hypertensive, with 64% uncontrolled. Uncontrolled hypertension results in substantial morbidity and utilization of health care resources. The emergency department (ED) is increasingly becoming a portal of entry into the health care system, as well as the primary care provider for the uninsured hypertensive patient. We sought to evaluate recidivism in hypertensive patients in the ED and correlate this with barriers to care, the Sixth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-VI) classification (stage 1: systolic blood pressure 140 to 159 mm Hg or diastolic blood pressure 90 to 99 mm Hg; stage 2: systolic blood pressure 160 to 179 mm Hg or diastolic blood pressure 100 to 109 mm Hg; stage 3: systolic blood pressure >180 mm Hg or diastolic blood pressure >110 mm Hg), and compliance.

Methods: This is a retrospective medical record review conducted on patients who enrolled in a multicenter study on hypertension and barriers to care in January 2002. This study was conducted at an urban Level I trauma center with a census greater than 110,000. For 2 years after enrollment, patients' records were reviewed for repeated visits to the ED for hypertension or complications, follow-up appointments, compliance with appointments, compliance with medications, substance abuse, or illnesses affecting compliance.

Results: During 1 week, 672 patients were defined as hypertensive by a blood pressure greater than 140/90 mm Hg and completed the questionnaire, which accounted for 23% of total ED visits for that week. In the retrospective medical record review, it was found that of these patients only 41% had follow-up appointments scheduled on ED discharge (JNC-VI 1 39%, JNC-VI 2 42%, and JNC-VI 3 45%). Of patients with appointments, 79% kept their follow-up appointment (JNC-VI 1 77%, JNC-VI 2 81%, and JNC-VI 3 82%). Fourteen percent of all patients had a repeated visit to the ED in the 2 years after enrollment (range 1 to 39, mean 4.9 visits; JNC-VI 1 38%, JNC-VI 2 19%, and JNC-VI 3 43%). Medication compliance was only 38%, whereas clinic compliance was 59%. Drug screens were positive in 60% of patients screened. Forty-seven percent of patients who had repeated ED visits had major end organ effect (cerebrovascular accident/respiratory failure/congestive heart failure).

Conclusion: Hypertension is a serious ED problem with major utilization of hospital and ED resources. Despite identification of hypertension in the ED, not all patients had arrangements for follow-up care. Repeated ED visits for hypertension are a common occurrence and are often related to compliance with medications, substance abuse, or end organ effects.

EMF-1 Assessment of the Standardized Reporting Guidelines Electrocardiogram Classification System: The Presenting Electrocardiogram Predicts 30-Day Outcomes

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Supported by a grant from the Emergency Medicine Foundation.

Study objectives: Standardized reporting criteria for risk stratification studies of patients with potential acute coronary syndromes have been proposed. We seek to determine whether the categories in the recommended 6-item ECG classification system predict rates of 30-day death, myocardial infarction, and revascularization.

Methods: We conducted a prospective cohort study of emergency department (ED) chest pain patients who presented to a tertiary care center during a 32-month period. The treating physician classified all ECGs into defined categories. Patients were followed up for 30 days to determine death, myocardial infarction, or revascularization. Our main outcome was the rate of triple composite endpoint of death, myocardial infarction, and revascularization at 30 days from ED presentation in relation to the ECG classification category.

Results: There were 3,814 patients who presented to the ED a total of 4,487 times during the study period. Patients had a mean (±SD) age of 51.8±15.9 years, were more likely to be female (59%) than male patients, and were most commonly black (68%). The relationship between initial ECG classification and 30-day outcome was highly significant ($P<.001$), with event rates ranging from 3.2% to 72.7%, depending on ECG classification category.

Conclusion: The ECG classification system that is being recommended in the standardized guidelines predicts 30-day composite rates of death, acute myocardial infarction, and revascularization.

EMF-2 Emergency Department Observation of Heart Failure Is Safe and Cost-Effective

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Supported by a grant from the Emergency Medicine Foundation.

Study objectives: We determine whether emergency department (ED)–based observation unit treatment of patients with heart failure can reduce inpatient admissions, hospital bed-hours, and costs without adversely affecting outcomes.

Methods: Two groups of risk-matched patients with acute decompensation of chronic heart failure were compared: (1) patients admitted before the availability of our observation unit; and (2) patients admitted to the observation unit after it was opened. Patients were enrolled if they satisfied Framingham criteria modified to include variables available in the ED. Patients believed to be at high risk or with new-onset heart failure were excluded. Outcomes were readmissions or repeated ED visits for heart failure and death. We compared crude estimates of bed-hours and charges between the groups.

Results: Sixty-four patients were enrolled, 36 admitted patients and 28 observation unit patients. Use of the observation unit avoided admission in more than 78.6% of cases; 22 observation unit patients who would have been admitted in the absence of an observation unit were not. No patients died within 30 days; 10 were readmitted. There was no difference in event rates between admitted patients (6 events, 16.7%) and observation unit patients (4 events, 14.3%; difference 2.4%, 95% confidence interval [CI] –16.9 to 19.9). Time from triage to discharge was significantly shorter for observation unit patients (median 25.7 hours, range 9.5 to 108.6) compared with admitted patients (median 58.5 hours, range 11.5 to 173.0); the mean number of bed-hours saved through observation unit use was 43.2 hours (95% CI 26 to 60.4 hours). Total charges were lower for observation unit patients (median $4,203, range $2,518 to $17,485) compared with admitted patients (median $7,824, range $3,730 to $34,604). The mean cost difference was $3,753 (95% CI $830 to $6,676), with the great majority of this difference accounted for by inpatient charges.

Conclusion: This pilot trial suggests that our subset of admitted heart failure patients may be safely and cost-effectively treated in an ED-based observation unit.

17 The Association Between Emergency Department Crowding and Time to Antibiotic Administration

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Study objectives: There is concern that crowding in our nation's emergency departments (EDs) leads to lower quality of care, but there is little evidence that this is the case. Time to antibiotic administration (TTAA) for patients with community acquired pneumonia (CAP) is a national hospital quality measure used by the Centers for Medicare and Medicaid and the Joint Commission on Accreditation of Healthcare Organizations where ED performance is critical. Our objective was to determine the relationship between ED crowding and TTAA for CAP patients.

Methods: We conducted a retrospective observational cohort study using the ED encounter database from a medium-sized community hospital in Connecticut to identify patients admitted with CAP from December 2001 through December 2002. "Crowding" was defined in 2 ways: (1) ED census when the CAP patient arrived exceeded ED bed capacity; and (2) mean ED length of stay for patients in the ED when the CAP patient arrived exceeded national mean (4 hours). Our outcome measure was based on national performance measures of TTAA for CAP (240 minutes). We reviewed medical records to determine TTAA for CAP patients. CAP cases were included in TTAA determination if age was older than 18 years, ED admitting diagnosis was CAP,

hospital discharge diagnosis was CAP, and admission was from home or a nursing home. CAP cases were excluded from TTAA determination if antibiotic therapy was given before presentation, the patient was in the hospital during the previous 10 days, or if immunodeficiency, *Pneumocystis carinii* pneumonia, or tuberculosis was suspected. We sought a sample size (N=310) to detect a 1-way difference of 12 minutes in TTAA with α=0.05 and β=0.80. Bivariate analyses were completed using simple linear regression and *t* test. Secondary analyses were also completed stratifying for pneumonia severity index (PSI) and the shift the CAP patient registered.

Results: We identified 438 CAP patients, of whom 302 met criteria for inclusion in the national quality measure. Patients' mean age was 71.8±16.8 years; 133 (44%) were women; 88 (29%) had a PSI of 90 or less (stable for outpatient treatment); and 264 (87%) were treated between 7 AM and 11 PM. The correlation coefficient for mean ED census versus TTAA was *R*=0.05 (*P*=.37) and for mean ED length of stay versus TTAA was *R*=0.02 (*P*=.69). Using "census greater than or equal to capacity" definition of crowded, the difference between TTAA during crowded and uncrowded periods was 2.4 minutes (*P*=.91). Using "ED length of stay greater than or equal to national mean" definition of crowded, this difference was 8.8 minutes (*P*=.75). Data stratified by PSI of 90 or less versus greater than 90 and by arrival between 7 AM and 11 PM versus 11 PM to 7 AM revealed no statistically significant associations. Post hoc analyses, although statistically not significant, show that TTAA was shorter at lower census (<70%).

Conclusion: ED crowding, by ED census or ED length of stay criteria, does not have a statistically significant association with TTAA for patients admitted with CAP. These results demonstrate that ED crowding is a complex problem, and more research is needed to understand its effect on patient care.

18 Oregon Health Plan Cutbacks and Access to Care: A Survey of Emergency Department Patients

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Study objectives: In February 2003, the Oregon Health Plan (OHP) altered coverage, enforcing premiums and copayments and reducing the scope of benefits for many members. Oregon's Medicaid expansion population, OHP Standard, was most seriously affected, with 49% of members leaving OHP so far and further reductions likely. Emergency departments (EDs) reported substantial increases in uninsured visits after these changes. The objective of this study was to survey ED patients several months after the changes to understand factors that affected their decision to seek care in the ED.

Methods: This was a survey of patients treated in an Oregon university hospital ED (annual volume 45,000 visits) from October 12, 2003, to November 3, 2003. Interviewers were available 8 AM to midnight, 7 days a week; study subjects were selected randomly (coin toss) from ED patients treated during these periods. Patients were excluded from the study if they were on psychiatric holds, trauma or sexual assault victims, in police custody, transferred from a skilled nursing facility, or unable to answer the survey in either English or Spanish or had been interviewed before. Surveys were administered in person to patients (or, for children, to their parents). Questions addressed the domains of demographics, medical-care-seeking behavior, outpatient resources, insurance status, and frequency of medical care use. Frequencies were compared with χ^2 analysis and counts with analysis of variance (with Bonferroni correction for multiple comparisons). Multivariable analysis was performed using a logistic regression model.

Results: There were 647 surveys completed, with a cooperation rate of 73%. Respondents were similar to the overall ED patient population in age, sex, and insurance status. Respondents' ages ranged from 5 days to 87 years, with a median age of 34 years. There were 353 (55%) female respondents. Two hundred twenty-three (35%) respondents reported their insurance status to be OHP, with 164 (26%) uninsured, 161 (25%) commercial or employer-sponsored insurance (ESI), 66 (10%) Medicare, and 27 (4%) other insurers. Of the uninsured patients, 48% reported their previous insurance as ESI, 44% as OHP, and 8% as other. Also, of the uninsured patients, 27% had been uninsured for less than 6 months ("newly uninsured"); 64% of these newly uninsured patients reported that their most recent insurance was OHP. Seventy-four percent of patients reported that their usual source of medical care was a traditional primary care provider such as a physician's office or outpatient clinic, 12% utilized the ED or an urgent care center as their usual source of care, and 15% reported that they did not have access to a regular source of care. Although only 45% of uninsured patients reported having a traditional continuity provider, such providers were reported much more frequently by patients with commercial insurance (87%), Medicare (85%), or OHP (81%; *P*<.001). Two hundred sixty (40%) respondents reported seeking medical advice elsewhere before coming to the ED. Only 26% of uninsured patients sought medical advice before coming to the ED compared with 47% of commercially insured patients, 38% of Medicare patients, and 47% of OHP enrollees (*P*<.001). Of patients with traditional continuity providers, 45% sought medical advice before coming to the ED compared with 26% of patients who identified the ED or an urgent care center as their usual source of care and 23% of patients with no regular source of care (*P*<.001). In a multivariable logistic model, insured patients were more likely to seek medical care before coming to the ED (odds ratio [OR] 1.9; 95% confidence interval [CI] 1.2 to 2.9), as were patients with a primary care provider (OR 2.1; 95% CI 1.4 to 3.3). Respondents reported an average of 2.1 ED visits in the 12 months preceding their current ED visit. OHP beneficiaries reported substantially more ED visits (mean 3.1) compared with uninsured patients (1.4) and commercially insured (1.2) patients (*P*<.001).

Conclusion: This study confirms previous research demonstrating the importance of the ED as a safety net for patients without insurance, with limited insurance, and without primary care providers. Although affiliation with a traditional primary care provider was reported about as often for OHP beneficiaries as for the commercially insured, the lack of such access by the uninsured raises concerns about worsening access to care as more Oregonians lose OHP coverage because of the current cutbacks. The higher ED use by OHP beneficiaries may reflect greater burden of illness, limited accessibility of the medical care delivery system that serves them, or individuals' selection of sites of medical care. Most of the newly uninsured had been covered by OHP. Future research will assess whether ED use will increase with the deteriorating access to primary care that is anticipated with further OHP cuts or decrease because of financial barriers among patients who lose OHP.

19 Emergency Department Treatment of Community-Acquired Pneumonia Decreases Hospital Length of Stay

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Study objectives: More than 4 million adults in the United States contract community-acquired pneumonia (CAP) each year. Approximately 1 million are hospitalized. Many reports have documented the success of efforts to decrease time receiving intravenous antibiotics, length of stay, and overall costs for pneumonia patients without adversely affecting outcomes. Early administration of antibiotics is cited as an important predictor of improved outcomes. We evaluate the difference in the inpatient length of stay and costs of emergency department (ED) admissions compared to elective admissions for CAP.

Methods: This was a statewide retrospective case-control study for California using patient discharge data for 2002 from the Office of Statewide Health Planning and Development (OSHPD). Patient admissions for pneumonia (diagnostic-related group 8, 9) receiving intravenous antibiotics (Current Procedural Terminology procedure code 9921) were included. Interventions were compared beginning on inpatient admission day comparing ED and elective. The subsequent length of stay for the ED admissions were compared with the elective admits. We excluded from our sample patients with length of stay greater than 60 days, as potential outliers. Because cost of care was an important variable in our regression model to control for case severity, we excluded those cases in which cost data were unavailable. Multiple regression was used to test for statistical significance of the identified difference in the average length of stay between ED and elective admissions, controlling for the type of admission (ED versus elective) and patient demographics (age, sex, race, ethnicity, payer status). We used estimated cost of care to control for case severity and derived estimated cost of care by multiplying patient level cost-to-charge ratio to patient charges. To control hospital practice patterns that may influence length of stay, we incorporated OSHPD hospital IDs into the model to absorb the hospital effect in the model. We used natural logarithms to control for left-hand-side tail to the length of stay data.

Results: On subjecting the sample to multiple regression, we found that the observed differences in the inpatient length of stay (ED versus elective) were statistically significant (*P*<.0001) for all the categories in the Table. No major statistically significant difference was observed among demographic subsets of patient categories.

Conclusion: Beginning clinical interventions a few hours sooner in the ED (compared with what an elective admission would receive) would reduce patients' subsequent need for hospital stay in days. This reduction would represent a cost savings to the system and may represent a higher quality of care for patients. These data